

REMARKS

Claims 1-11, 31-36, 55, 72-79 and 81-86 were previously canceled while claims 37-54 were previously withdrawn from consideration. Therefore, claims 12-30, 56-71, 80 and 87-110 are currently at issue.

Claims 12, 56, 80, and 90 are amended to correct antecedent basis issues or minor grammatical errors within the claims. No new matter is introduced by these amendments.

35 U.S.C. § 112, First Paragraph

Applicants respectfully traverse the rejection of claims 12-30, 56-71, 80, and 87-110 under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement. In particular, the claims are rejected for containing subject matter not described in such as way as to enable one skilled in the art to make and/or use the invention. More particularly, the office action asserts that there is no enablement for a message for a field device to be received by a first device, and no enablement for a field device message to be provided by a first device. Claims 12-30 are amended to more clearly recite that a message for a field device is received for a field device. Claims 56-71, 80, and 87-110 are amended to more clearly recite a first interface adapted to receive a control message from a process controller for a field device and/or to provide one or more field device messages from a field device to the process controller. Thus, the rejection under § 112, first paragraph, of claims 12-30, 56-71, 80, and 87-110 is now moot and should be withdrawn. Applicants submit that these amendments do not narrow the scope of the pending claims in any manner.¹

Applicants respectfully traverse the rejection of claim 80 as lacking enablement for reciting the limitation of one of an input/output (I/O) device and a field device comprising a process controller adapted to produce a control message for receipt by a field device. Claim 80 is amended to more clearly recite that a process control system includes a process controller adapted to produce a control message for receipt by a field device, instead of one of an I/O device or a field device comprising a process controller adapted to produce a control message for a field device. Thus, the rejection is now moot and should be withdrawn.

¹ Applicants note that the pending claims recite an I/O device that receives control messages from a process controller for a field device or that provides a process controller with a field device message from a field device. The pending claims do not require that the I/O device be directly coupled to a field device. For example, the field device messages from the field device may be provided to the I/O devices by other devices capable of communicating with the I/O device and with the field device, such as other I/O devices.

35 U.S.C. § 112, Second Paragraph

Applicants respectfully traverse the rejection of claims 56-71, 80, and 87-110 under 35 U.S.C. § 112, second paragraph for being indefinite. In particular claim 56 is rejected for lack of antecedent basis for the phrase “the first device.” Claim 56 is amended to recite “the field device,” thereby providing the necessary antecedent basis support.

Claim 91 is rejected as being indefinite or alternatively as lacking written description support for the phrase, “a plurality of I/O devices coupled to the bus for providing communications between the process controller and a plurality of first devices.” The office action asserts that the limitation suggests a possibility that each of the plurality of I/O devices may provide communications between the process controller and *all* the first/field devices. This interpretation of the limitation is warranted as included within the scope of the claims and there is no indefiniteness issue. (See MPEP § 2173.04 addressing indefiniteness). In particular, the claimed limitation is not improper as it is fully supported by the specification. The specification describes in Figures 1 and 2 that a process control system, as known by those skilled in the art, may include a redundant pair of I/O devices 120 and 122 that may be connected to a same set of field devices 113-115. Figures 1 and 2 further illustrate that a first I/O device 140 may be connected to a first set of field devices 142 and 144 and that a second I/O device 150 may be connected to a second set of field devices 152 and 154 (different from the first set of field devices). The I/O embodiments of the application are described within the context of the I/O devices 130, 140, and 150 that are well known in the art, where each new I/O embodiment described in the specification may be used as one of I/O devices 130, 140, and 150. Thus, an interpretation of claim 91 wherein each of a plurality of I/O devices may be connected to the same plurality of field devices or wherein each I/O device may be connected to a different set of field devices is both properly supported.

Applicants note that MPEP § 2163(I) specifically recites the test for the written description requirement as: “To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention.” This standard does not require verbatim written description support. Further, to establish a *prima facie* case of lack of written description, the Examiner has the burden of “providing reasons

why a person skilled in the art at the time the application was filed would not have recognized that the inventor was in possession of the invention as claimed in view of the disclosure of the application as filed.” MPEP § 2163(I). The Examiner has failed to support a *prima facie* case of lack of written description requirement nor can the Examiner support a *prima facie* case, as the above discussion specifically points out the support for the claim limitations. Thus, Applicants request that the Examiner withdraw the § 112, second paragraph rejection of claim 91.

Claim 92 is rejected as being indefinite for using the phrase, “each I/O device of the plurality of I/O devices further comprises a second interface for coupling the I/O device to at least one of the plurality of first devices.” The office action appears to indicate a confusion with the claimed first device. In response to the examiner’s concerns with regard to this limitation, Applicants amend claim 92 to recite a second interface for coupling the I/O device to at least one of the plurality of *field* devices. Applicants do not believe that this amendment narrows the scope of claim 92, or independent claim 91, in any manner. Thus, the rejection of claim 92 with respect to § 112, second paragraph is now moot and should be withdrawn.

Claim 93 is rejected as being indefinite for using the phrase, “wherein the at least one of the plurality of first devices is a field device.” Claim 93 is amended to now recite that the at least one of the plurality of field devices is a sensor or a valve, thereby specifically reciting two types of field devices. This amendment is fully supported at least by Figure 8, and page 28, lines 19-25 of the specification as originally filed. Thus, the rejection of claim 93 with respect to § 112, second paragraph rejection is now moot and should be withdrawn.

35 U.S.C. § 103

Applicants respectfully traverse the rejection of claims 12-13, 18, 56-57, 62, 80, 87-88, 91-94, and 99 as obvious over McLaughlin et al. (U.S. Patent No. 5,202,822).

Each of claims 12-30, 56-71, 80, and 87-110 is amended to more clearly recite an input/output (I/O) device that receives control messages from a process controller for a field device via a bus using a first interface **directly coupled to the bus** and communicatively linking the I/O device with the process controller via the bus, where the I/O device communicates with a field device apart from the bus using a second interface, and where the I/O device severs the link to the bus upon detection of a fault. None of the cited art discloses or teaches an I/O device that receives control messages for receipt by a field device from a

process controller via a bus using a first interface directly coupled to the bus and communicatively linking the I/O device with the process controller via the bus, where the I/O device communicates with a field device apart from the bus and severs a coupling to the bus upon detection of a fault, as recited by these claims. Therefore, no combination of the cited art can render any of these claims obvious.

The office action reads element 21-A of McLaughlin et al. (specifically described as an I/O device by McLaughlin et al.) in combination with element 251 of McLaughlin et al. as the recited I/O device, where elements 30 and 40 of McLaughlin et al. are process controllers coupled to elements 21-A and 21-B via busses 22 and 23. Further, the office action reads a connection from element 21-A to a terminal 252, (equivalent to a terminal A illustrated in Figure 6) as the claimed first interface for receiving control messages from a process controller for a field device via a bus. However, the terminal 252 is not directly coupled to a bus by which the asserted I/O device (i.e., the combination of the element 21-A and the element 251) communicates with process controller 30 or 40. In fact, the examiner appears to acknowledge that the element 251 is not directly coupled to a process controller (see page 6, first paragraph of the office action, which asserts that “FTA [2]51 is communicatively linked with the process controller via the bus; note that the limitation does not require the first interface to be directly connected to the bus”). Thus, the connection from the element 21-A to the terminal 252 is not a first interface **directly** coupled to a bus that communicatively links the I/O device with the process controller via the bus, as recited by the claims at issue.

Moreover, McLaughlin et al. does not suggest or teach that the terminal 252 can be directly coupled to a bus (such as the bus 22 or 23 of McLaughlin et al.) by which an I/O device (such as the device 21-A or 21-B, as specifically defined by McLaughlin) may communicate with a process controller (such as the process controller 30 or 40). Instead, McLaughlin et al. teaches the opposite, that the terminal 252 should not be connected to the bus 22 or 23 (which are connected to the process controllers 30 and 40). In particular, the terminal 252 connects one of the elements 21-A or 21-B to a field device 250 and communicates with the field device 250 in a manner different than the manner in which the I/O devices 21-A and 21-B communicate with process controller 30 or 40. As illustrated in Figure 4 of McLaughlin et al. (with corresponding descriptions at Col. 5, lines 56-67; Col. 6, lines 1-9), the I/O device 21-A communicates with the process controller 30 or 40 via the bus 22 or 23. A microprocessor 22 of the I/O device 21-A uses the communication from the

process controller 30 or 40 to control a current source 211-A which provides a different signal to the field device 250 (i.e., a current signal which is different than the signals received from or provided to the process controllers 30 or 40 via bus 22 or 23). Thus, if terminal 252 is directly coupled to the bus 22 or 23, both the current source 211-A and the process controllers 30 or 40 would be attempting to drive the bus 22/23 with different protocols. Moreover, one skilled in the art would recognize that directly connecting the current source 211-A, which outputs the current signal developed by the I/O device 21-A, to the bus 22/23 would actually disrupt communications on buses 22/23 and render the McLaughlin et al. system inoperative. It follows, therefore, that McLaughlin et al. does not disclose or teach an I/O device that receives control messages for receipt by a field device from a process controller via a bus using a first interface directly coupled to the bus and communicatively linking the I/O device with the process controller via the bus, as recited by the claims at issue.

Applicants therefore respectfully submit that none of the claims at issue are rendered obvious by any combination of McLaughlin et al., Safadi (U.S. Patent No. 5,379,278), Yap (U.S. Patent No. 6,073,193), Lee et al. (U.S. Patent No. 6,615,301), what the examiner has referred to as the Applicants Admitted Prior Art (AAPA), and Kato et al. (U.S. Patent No. 6,397,277). In particular, no combination of McLaughlin et al. with Safadi, Yap, Lee et al., the AAPA, and Kato et al. can render any of the claims at issue obvious because none of Safadi, Yap, Lee et al., the AAPA or Kato provides the disclosure missing in McLaughlin et al. As discussed in the previous response, Safadi does not disclose severing of a communication connection based on the detection of a device fault within any type of device, much less a process control device such as an I/O device or a field device. While each of Yap, Lee et al. and Kato et al. are generally directed to computer related communication devices, these documents do not disclose a process control system, much less the use of I/O devices or field devices within a process control system. As a result, none of Safadi, Yap, Lee et al. or Kato et al. provides any disclosure or suggestion of an I/O device that severs its connection with a bus upon the detection of a device fault. Likewise, the AAPA, which merely discusses one possible effect of an I/O device undergoing a failure on a bus, does not provide this disclosure.

Still further, none of the cited art provides a motivation to modify any of their teachings to provide an I/O device for coupling one or more devices (e.g., field devices) to a process controller via a bus that severs a connection between the I/O device and the bus upon

detection of a fault in the I/O device. McLaughlin et al. does not even recognize the problem with malfunctioning I/O devices disrupting communications along a bus connected to a process controller because McLaughlin et al. is not concerned with communication problems between any device on the bus connected to a process controller. Specifically, McLaughlin discloses operation of redundant I/O devices in which only one I/O device may be connected to a field device at a time while all other redundant I/O devices must be disconnected from the field device. Thus, McLaughlin is primarily concerned with preventing more than one of the redundant I/O devices from communicating with the same field device at the same time, not with an I/O device interfering with the communications of other devices on a bus connecting an I/O device to a process controller. In fact, the McLaughlin et al. system operates in a manner that assumes that no communication problems occur with respect to the communication bus 22 or 23, as both of the redundant I/O devices of McLaughlin et al. are always communicating with a process controller via the bus 22 or 23, regardless of which I/O device is turned on (i.e., communicating with the field device). The claimed device and method, on the other hand, is used, for example, to prevent a faulty I/O device from interfering with the communications of other such devices on the bus. McLaughlin et al. does not recognize this problem, much less provide any suggestion or motivation for correcting this problem.

It is clear that the prior art must make a suggestion of or provide an incentive for a claimed combination of elements to establish a prima facie case of obviousness. See, *In re Oetiker*, 24 U.S.P.Q.2d 1443, 1446 (Fed. Cir. 1992); *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. 1985). This principle holds true even if the applied art could be modified to produce the invention recited by the pending claims. See, *In re Mills*, 16 U.S.P.Q.2d 1430, 1432 (Fed. Cir. 1990); *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984) ("The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.") Because each of McLaughlin et al., Safadi, Yap, Lee et al., the AAPA, and Kato et al. fails to disclose or provide any motivation for severing a communication connection between an I/O device and the bus to which it is connected within a process control system, it follows that no combination of these documents can render any of the claims 12-30, 56-71, 80 and 87-90 obvious.

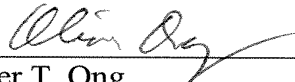
CONCLUSION

For the foregoing reasons, Applicants respectfully request reconsideration and withdrawal of the rejections and allowance of claims 12-30, 56-71, 80 and 87-110. If there are matters that can be discussed by telephone to further the prosecution of this application, Applicants respectfully request that the Examiner call its attorney at the number listed below.

In view of the above amendment, Applicants believe the pending application is in condition for allowance.

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Respectfully submitted,

By 

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